DOCUMENT RESUME

ED 276 563 SE 046 636

AUTHOR Hensley, Michael
TITLE Solar Energy Information and Education Project. Final Report.
INSTITUTION New Mexico Solar Energy Inst., Las Cruces.
SPONS AGENCY New Mexico State Legislature, Santa Fe.
REPORT NO NMERDI-2-72-4233
PUB DATE Sep 85
NOTE 74p.; Fiscal year used in document was derived by subtracting 1912 (year of New Mexico statehood) from 1985 (year of report).
AVAILABLE FROM New Mexico Energy Research and Development Institute Information Center, University of New Mexico, 457 Washington SE, Suite M, Albuquerque, NM 87108.
PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Communications; Energy Conservation; *Energy Education; *Information Services; School Business Relationship; *Science Programs; *Solar Energy; *Technical Assistance; Technology Transfer; Workshops
IDENTIFIERS *New Mexico

ABSTRACT

The New Mexico Solar Energy Institute (NMSEI) conducted a concentrated information and education program during 1985. This report summarizes NMSEI's Information and Education project activities. It provides detailed descriptions of project costs and concise recommendations for similar programs. Individual sections contain explanations of the scope of work, approach, accomplishments, and recommendations for each of the project's six tasks. These tasks focus on: (1) technical assistance; (2) solar business directory; (3) New Mexico media; (4) information service and state fair exhibit; (5) solar energy workshops; and (6) solar energy education. Samples of services include media packets, a tollfree energy information line, a newsletter for teachers and computer assisted analysis of space heating needs. (ML)

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NMERDI 2-72-4233

SOLAR ENERGY INFORMATION AND EDUCATION PROJECT

Principal Investigator:
Michael Hensley

Contributors:
Lisa Johnson
Grant Price
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September 1985

New Mexico Energy Research and Development Institute

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The New Mexico Energy Research and Development Program is funded by the New Mexico State Legislature and is administered by the New Mexico Energy Research and Development Institute, Pinon Building, Room 358, 1220 South St. Francis Drive, Santa Fe, New Mexico 87501.

2-72-4233

SOLAR ENERGY INFORMATION AND EDUCATION PROJECT

Final Report

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The work from which this material is drawn was conducted with the support of the New Mexico Energy Research and Development Institute. However, the author remains solely responsible for the content of this material.

BIBLIOGRAPHIC DATA SHEET
for reports sponsored by the
New Mexico Energy Research and Development Institute
Santa Fe, NM 87501

1. NMERDI REPORT NO.	2. PUBLICATION DATE	3. NO. OF PAGES
2-72-4233	September 1985	51

4. TITLE AND SUBTITLE
Solar Energy Information and Education Project, Final Report

5. AUTHOR(S)
Michael Hensley

6. NAME AND ADDRESS OF PERFORMING ORGANIZATION
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7. ABSTRACT

The New Mexico Solar Energy Institute conducted a vigorous information and education program during Fiscal Year 73. NMSEI conducted workshops, educational fiestas, and seminars. Media packets were distributed to all New Mexico media entities while NMSEI's radio programs were distributed to many stations.

Many callers received valuable unbiased information from the SUN DIAL LINE, a tollfree energy information line. Teachers received the "Solar Energy Educator" newsletter. Computer assisted analysis of space heating needs, passive solar homes, and active solar hot water systems was performed by the Information and Education project staff for builders, designers, and architects.

This report summarizes NMSEI's Fiscal Year 73 Information and Education project activities. It includes detailed descriptions of project costs and concise recommendations for similar programs.

8. KEY WORDS

Information; technology transfer; education; technical assistance; publication; media

9. AVAILABILITY
Copies of this report are available from the New Mexico Energy Research and Development Institute Information Center, University of New Mexico, 457 Washington SE, Suite M, Albuquerque, NM 87108. Tel. (505) 277-3661. Please inquire as to price.

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ACKNOWLEDGEMENTS

The principal investigator gratefully acknowledges the diligent efforts of Lisa Johnson, Grant Price, Paul Rowland, Martin Selinfreund, and Dorothy Sullins of the New Mexico Solar Energy Institute Information and Education Project staff throughout Fiscal Year 73. Their professional dedication to excellence and quality is deeply appreciated.

SOLAR ENERGY INFORMATION AND EDUCATION PROJECT

INTRODUCTION

During Fiscal Year 73, the New Mexico Solar Energy Institute's (NMSEI) Information and Education Project responded to increased public demand for renewable energy education with a vigorous, innovative, and cost-effective program. Many approaches were used to meet the diverse educational needs of New Mexico's population.

NMSEI furnished information to the general public, special interest groups, and key decision makers through publications, workshops, seminars, exhibits, media development, and educator forums. Important personal assistance was given at individualized professional solar heating design assistance conferences, small group seminars, and trade exhibits and fairs.

To enhance renewable energy technology use in all regions and populations within New Mexico, the NMSEI Information and Education Project rendered its services throughout the state. Workshops and seminars continue to stimulate growth of local renewable energy networks.

Many solar businesses participated in NMSEI's Information and Education efforts during FY 73. Businesses provided commercial exhibits at NMSEI events. Many business people were guest presenters or professional resources at NMSEI workshops. A four-day workshop series was presented in conjunction with the New Mexico Solar Energy Industries Association (NMSEIA) to meet the specific educational needs of the solar business community.

Consistent evaluation optimized allocation of NMSEI's limited resources. Mail surveys of new services were conducted. Analyses of continuing efforts were undertaken. Results of these surveys will be used to improve future NMSEI Information and Education activities.

This report capsulizes the NMSEI Information and Education Project activities for Fiscal Year 73 and is structured around the Information and Education Project's contractual tasks. These tasks are:

Task 1: Technical Assistance

Task 2: Solar Business Directory

Task 3: New Mexico Media

Task 4: Information Services and State Fair Exhibition

Task 5: Solar Energy Workshops

Task 6: Solar Energy Education

The scope of work, approach, accomplishments, and recommendations for each contractual task are delineated in individual sections. Summary recommendations for information and education services are contained in the final section.

TASK 1: TECHNICAL ASSISTANCE

Objectives

The technical assistance task has two principal objectives. First, this task educates builders and owner builders about energy efficient and cost-efficient construction techniques. The goal of this objective is to increase the number of residences in New Mexico which use solar energy as a principal space heating fuel source or incorporate energy efficient building techniques during construction. Second, the technical assistance task impacts long-term economic development since

consumers with lower utility expenses will have a higher percentage of income available for spending or investment. Redirection of residential construction practices will increase demand for new, energy efficient building products and skilled tradesmen. Associated economic development in vocational training, sales, product research and development, and other areas will be stimulated.

The primary emphasis within this task is on personalized technical solar heating assistance. The four subtasks of this task are:

Task 1.1: Design and package a design assistance module including short slide presentations, scale model homes, energy related product information, computer calculation worksheets, solar home blueprints, and a solar construction bibliography.

Task 1.2: Coordinate and schedule a quarterly design assistance outreach schedule

Task 1.3: Deliver technical assistance to target audiences in designated communities.

Task 1.4: Evaluate the technical assistance task by assessing the degree of utilization of the advice given by technical assistance staff to participants. This assessment should include a calculation of the energy savings if NMSEI tehnical assistance conclusions are implemented.

APPROACH

The cornerstone of this task is analysis of house plans and suggestions for modifications which will enhance the energy performance of the houses. A computer program to perform this analysis has been written by NMSEI technical assistance staff. This program incorporates the passive solar energy guidelines developed by the Los Alamos National Laboratory.

Computer programs to analyze active solar water heating systems, active solar space heating systems and active solar swimming pool systems were also purchased. Two IBM computers have been dedicated to this task.

Technical assistance clients complete simple construction data worksheets and return them to NMSEI. The NMSEI technical assistance staff developed worksheets to analyze passive solar homes, active solar space heating systems, active solar water heating systems, and swimming pool systems.

The technical assistance student staff enters data provided by the client and submits the results to a professional staffperson for analysis. The consumer is provided suggestions for modifications which will make the house more energy efficient.

Some technical assistance inquiries may be answered by providing basic solar information or generic product information. NMSEI provides this service through telephone, written correspondence, or personal contact during workshops and seminars.

NMSEI maintains a technical assistance outreach program to provide service to all geographic regions of New Mexico. The Information and Educaton staff developed slide presentations to use as a teaching aid

during these visits. Specialized bibliographies were provided upon request.

The technical assistance staff also constructed models of passive solar homes and solar retrofits. These were used to illustrate solar principles during presentations and technical assistance conferences. Solar home plans were available for consumer perusal during technical assistance conferences.

RESULTS

During Fiscal Year 73, 943 persons used NMSEI's technical assistance services. Passive solar construction was an area of concern for 490 persons while 76 people wanted information regarding energy conservation options. Active solar space heating by hydronic means interested 81 persons while active solar space heating with air systems prompted inquiry from 47 persons. Table 1 shows NMSEI technical assistance services by category and month.

Public demand for NMSEI technical assistance services demonstrated minimal seasonal variation. Peak demand occurred in January when 108 persons received technical assistance. Demand in April was also large with 106 requests, while 102 persons received technical assistance in June. Lowest need for services was in July when 40 persons requested assistance. Table 1 also illustrates NMSEI technical assistance services provided each month.

NMSEI provided technical assistance in 25 of New Mexico's 32 counties. Primary demand for NMSEI technical assistance came from Dona Ana County, where 359 persons used this service; Bernalillo County, had 194 cases, and 77 persons from Santa Fe county used this service.

TABLE 1
NMSEI TECHNICAL ASSISTANCE INFORMATION AND EDUCATION PROJECT BY MONTHLY CATEGORIZED TOTALS

Category	1984 July	Aug	Sept	Oct	Nov	Dec	1985 Jan	Feb	March	April	May	June	Category Total
Passive Solar	19	39	31	29	40	39	58	39	32	70	43	51	490
Solar DHW	2	0	2	3	1	2	4	2	3	4	9	5	37
Energy Conservation	1	11	0	7	7	3	15	0	9	2	11	10	76
Research and Development	6	3	13	0	9	1	1	2	0	0	3	4	42
Active Solar Space Heating-Air	5	5	0	6	4	5	7	1	2	7	4	1	47
Active Solar Space Heating-Hydronic	2	1	0	10	7	8	11	10	5	11	6	10	81
Swimming Pool or Spa	0	0	0	1	3	1	1	0	2	2	1	0	11
Cooling and Ventilation	1	0	0	1	0	0	0	1	0	1	4	0	8
Tax Credits	0	0	0	6	0	0	0	1	0	2	1	1	11
Miscellaneous	4	8	23	16	13	8	11	8	11	7	11	20	140
Monthly Totals	40	67	69	79	84	67	108	64	64	106	93	102	943

Table 2 illustrates monthly requests for NMSEI technical assistance services by county.

Adoption of solar technologies is perhaps best motivated by personal interactions. NMSEI's technical assistance staff provided on-site services in 25 New Mexico cities including Silver City, Deming, Las Cruces, Cloudcroft, Alamogordo, Roswell, Portales, Clovis, Dora, Tucumcari, Santa Fe, Los Alamos, Wagon Mound, Springer, Ojo Caliente, Farmington, Gallup, Twin Lakes, Vanderwagon, Quemado, Bernalillo, Jemez Pueblo, and Socorro. The NMSEI technical assistance staff was available in Albuquerque on three occasions.

Many persons using the technical assistance service are currently building or remodeling a home, installing energy conservation devices, or selecting an active solar heating system. They use the NMSEI technical assistance service to optimize their design or refine their selection process. During the analysis, the technical assistance staff calculates energy savings to which a monetary value may be attributed. During Fiscal Year 73, if the technical assistance clients implemented the modifications suggested by NMSEI staff, energy currently valued at $33,458 would be saved annually.

In January, the NMSEI began to survey recipients of the technical assistance service to assess their implementation of the advice given by the technical assistance staff. It became apparent that participants required a longer time to implement the information than was being allowed. A survey system was subsequently devised that allowed a lapse of 120 days prior to an initial survey of the participants. Respondents who indicated implementation intentions but required more time for their project were or will be recontacted 180 or 365 days after their technical assistance conference date.

TABLE 2
GEOGRAPHIC DISPERSEL OF NMSEI INFORMATION AND EDUCATION PROJECT TECHNICAL ASSISTANCE SERVICES BY MONTH

	1984 July	Aug	Sept	Oct	Nov	Dec	1985 Jan	Feb	March	April	May	June	County Total
Out-of-state	4	1	0	0	1	0	3	0	0	3	5	0	17
Bernalillo	5	10	12	13	10	22	23	10	19	14	21	35	194
Catron	0	0	0	0	0	0	0	0	0	0	0	2	2
Chaves	2	0	1	0	10	5	1	1	3	0	2	2	35
Colfax	0	0	0	0	0	0	1	1	1	4	1	1	9
Curry	0	0	1	0	0	0	1	0	1	5	0	3	13
De Baca	0	0	0	0	0	0	0	0	0	0	0	0	0
Dona Ana	21	32	29	36	38	10	39	18	16	57	38	25	359
Eddy	0	0	1	1	0	0	0	0	0	0	0	0	2
Grant	0	1	2	5	1	3	7	14	3	3	1	2	42
Guadalupe	0	0	0	0	0	0	0	0	0	0	0	0	0
Harding	0	0	0	0	0	0	0	0	0	0	0	0	0
Hidalgo	0	0	0	0	0	0	0	0	0	0	0	0	0
Lea	0	0	0	0	0	0	1	0	1	0	1	1	4
Lincoln	0	0	1	0	0	0	0	0	1	0	1	1	4
Los Alamos	3	4	0	0	2	3	6	1	2	1	1	4	27
Luna	0	1	1	0	0	0	0	0	1	0	0	0	3

TABLE 2 (continued)

	1984 July	Aug	Sept	Oct	Nov	Dec	1985 Jan	Feb	March	April	May	June	County Total
McKinley	2	0	0	0	0	1	0	0	0	0	1	1	5
Mora	0	0	0	0	0	0	0	0	0	0	0	0	0
Otero	1	8	5	10	7	4	7	1	4	3	4	3	57
Quay	0	1	0	0	0	1	0	1	1	0	0	0	4
Rio Arriba	0	0	1	2	0	0	1	0	0	0	0	0	4
Roosevelt	1	0	7	0	1	1	2	2	1	0	2	2	19
Sandoval	0	1	1	3	2	3	2	1	1	1	1	1	17
San Juan	1	1	1	2	1	1	4	1	0	2	1	1	16
San Miguel	0	0	1	0	0	0	0	0	0	0	0	0	1
Santa Fe	0	6	5	5	3	6	6	11	7	8	10	10	77
Sierra	0	0	0	0	0	1	3	0	0	0	0	0	4
Socorro	0	0	0	0	0	2	0	0	1	0	2	2	7
Taos	0	0	0	0	0	0	0	0	0	2	0	2	4
Torrance	0	0	0	0	0	1	1	1	0	2	0	1	6
Union	0	0	0	0	0	0	0	0	0	0	0	0	0
Valencia	0	1	0	2	0	2	0	1	1	1	1	1	10
Total													943

This survey is an ongoing task.

RECOMMENDATIONS

The technical assistance task provides a valuable service to New Mexico particularly in the area of passive solar design and construction. It renders a high quality service and provides accurate results in a timely manner. It has developed a professional constituency and receives favorable public review.

A much greater geographic dispersal of services was observed in FY 73 than in previous years. However, consideration must be given to the geographic dispersal of services statistic. While statewide utilization of the service is increasing, 38 percent of all technical assistance services were rendered in Dona Ana County during Fiscal Year 73, and 21 percent were provided to Bernalillo County residents. A wider diffusion throughout the state will continue to be a priority objective for the technical assistance task.

Continued cooperation with trade organizations is also an important objective for this task. Support by groups such as the National Association of Home Builders, the Construction Specifications Institute, and the New Mexico Solar Energy Industries Association (NMSEIA) is integral to continued growth of the technical assistance task. Mutually beneficial efforts such as trade shows, workshops, and committee memberships should be maintained and increased.

TASK 2: SOLAR BUSINESS DIRECTORY

OBJECTIVES

The primary objective of this task is to stimulate solar business activity through publication of a directory which provides information

about available services and vendors. For a prospective buyer, the directory presents timely and useful information about firms which sell solar energy equipment and services. For possible users of New Mexico's solar energy research facilities, the directory provides a comprehensive schedule of firms engaged in this activity. For potential investors, the directory provides an overview of solar business activity in New Mexico.

A secondary objective of this task is to provide consumer information which facilitates purchase of appropriate solar energy equipment by consumers. This objective has long-term impact as it reduces consumer dissatisfaction and enhances consumer perception of solar equipment.

This task prepared camera-ready copy of the 1985 New Mexico Solar Business Directory. Copy was provided to the New Mexico Energy Research and Development Institute Information Center where publication was expedited.

APPROACH

NMSEI has participated in the compilation of each New Mexico Business Directory published since 1978. A mailing list of 306 possible directory listings was amassed from previous business directory mailings, trade association membership lists, telephone directories, and economic development sources. Concurrently, survey forms were developed for previously listed businesses and new potential listings. These forms were reviewed by NMSEI and New Mexico Energy Research and Development Institute (NMERDI) staff. An appropriate form was mailed to each potential listing with four weeks allowed for the form's return.

A telephone survey of potential listings was initiated when mail response was judged inadequate. Fifty-two percent of the possible business directory listings were contacted by telephone.

Survey results were compiled and a draft manuscript provided to NMERDI, NMERDI Information Center (NMERDI-IC) NMSEIA, New Mexico Solar Industry Development Corp. (NMSIDC) and other appropriate entities for review. An edited manuscript was provided to the NMERDI-IC for typesetting.

Layout and paste-up of the typeset copy was completed and sent to the NMERDI-IC for proofreading and production of camera-ready copy. Five thousand copies of the 1985 Solar Business Directory were produced.

RESULTS

Two hundred and fifty businesses were listed in the 1985 New Mexico Solar Business Directory. One hundred and twenty-one respondents were described as "dealers, distributors, wholesalers." One hundred and thirty-one businesses were involved in sales and installation of residential active solar space and water heating systems while 106 businesses indicated they sold and installed commercial solar space and water heating units.

Seventy-one listings were architects or engineers, while 90 respondents participated in residential construction. Sixty-five businesses were listed in the commercial solar construction category.

Fifty-seven businesses were listed as manufacturers and assemblers of solar equipment, while 44 companies indicated involvement in research and development activities. Eighteen organizations indicated test facilities were available for use.

Bernalillo County had 139 businesses listed in the directory, while the poll of Santa Fe County showed 53 companies involved in solar activities. Twenty businesses listed Dona Ana County as their principal location.

A letter to confirm listing information has been sent to each business in the directory. Responses indicate there were very few errors in the published information.

Two thousand copies of the directory have been distributed by NMSEI during Fiscal Year 73.

RECOMMENDATIONS

The 1985 New Mexico Solar Business Directory is an outstanding consumer publication. It provides information unavailable from other sources and provides a complete collection of active businesses that is very useful.

During Fiscal Year 73, milestones for the directory were adjusted to allow distribution of the Albuquerque SolarFest. Camera-ready copy was provided to the NMERDI-IC 26 days before the scheduled milestone date. This advanced submission may be attributed to professional capabilities of the NMSEI lead staffperson on this task and use of advanced project management techniques that allow continuous assessment of a project's status.

The 1985 directory lists 50 percent more entries than the 1984 directory. However, it is not expected that a 1986 directory would reflect equivalent growth since the New Mexico renewable energy tax credits will expire on December 31, 1985. A recent study commissioned by the New Mexico Energy Research and Development Institute estimated

that 50 percent of all solar businesses will expire within the first six months of 1986 in this scenario and extends this percentage to as high as 93 percent if the federal tax credits should also be allowed to expire. It is recommended that any 1986 edition of the New Mexico Solar Business Directory begin the publication process no earlier than March, 1986. This date will allow maintenance of the accuracy for which this publication is noted.

TASK 3: NEW MEXICO MEDIA

OBJECTIVES

The principal objective of the New Mexico task is to provide solar energy and energy conservation informational materials for use by the New Mexico media. By providing this service, NMSEI dispenses accurate renewable energy information to a broad, statewide audience in a cost-effective manner. Longer term NMSEI informational goals are also met by this persistent effort to raise the renewable energy literacy of New Mexico homeowners.

A secondary objective of this task is to positively influence public perception of NMERDI and NMSEI. This second objective is obtained by publicity efforts which increase the public visibility of the institutes and appropriately influence the general public and key decision makers. This effort is particularly important to other NMSEI and NMERDI programs.

The New Mexico Media task's objectives are met through two subtasks.

Task 3.1 The responsibilities of this subtask are:

a. Develop and distribute solar energy news releases, information columns, articles, features, and fillers appropriate for print media entities.

b. Develop and produce, and distribute the "Thinking Solar" radio programs for New Mexico radio stations.

c. Develop and contribute materials for the "Entrada al Sol" section of Energy Source.

d. Develop, produce and distribute television and radio public service announcements.

Task 3.2 The responsibilities of this subtask are:

a. Maintain and expand state and national media contacts by instigating articles that directly or indirectly feature NMSEI activities.

b. Maintain an active role in the New Mexico Press Association and the New Mexico Broadcasters Association.

c. Provide information at state conventions of media organizations.

APPROACH

The objectives of the New Mexico Media task are met using a broad, flexible approach. Radio, television, magazine, newspaper, and newsletter mediums are used to publicize NMSEI and NMERDI activities.

"Thinking Solar" radio tapes feature solar energy or energy conservation information and are recorded at NMSEI. A media staff person interviews a member of the NMSEI professional staff using a prepared manuscript. After editing, the tapes are distributed to radio

stations throughout New Mexico. Each tape includes five three-minute segments. It is formatted to allow modification by the local station but guarantees maintenance of the presentation's accuracy and quality.

NMSEI staff members are often guests on radio and television interview or roundtable discussion programs. Some radio interviews are conducted by telephone. This service increases the number of people NMSEI informs each year.

Public service announcements (PSAs) are provided to radio stations in print format for important NMSEI and/or NMERDI events. All broadcast media outlets receive these bulletins.

Video public service announcements are produced for important events and distributed to New Mexico television stations. In some cases, these video PSAs are sent to Texas, Colorado, and Arizona television stations that include areas of New Mexico in their service regions.

NMSEI also sends announcements to local cable television outlets for use on their "cable crawl" or weather station. This effort has been very productive.

NMSEI's print media distribution efforts provide a vast amount of information for media use. "Thinking Solar" newspaper and newsletter columns are prepared using the "Thinking Solar" radio tapes and other NMSEI informational materials. These columns are distributed throughout New Mexico and are used in many forms. Some editors use the complete column while others use the information in a question and answer column such as the Albuquerque Journal's "Action Line."

News releases are sent to print and broadcast media outlets and publicize all NMSEI and/or NMERDI events. These releases are sent to

all New Mexico media and to media in Colorado, Texas, and Arizona with New Mexico service areas. The NMSEI calendar of events is distributed to a similar group and is also mailed to nationally periodicals such as "Solar Age" and "New Shelter." Many announcements of NMSEI events appear in these magazines at no charge.

The NMSEI media staff develops solar energy and energy conservation feature and filler articles and provides this copy to all New Mexico print and broadcast media. Sets of these articles are mailed twelve times per year.

Articles featuring NMSEI projects are developed on an intermittent basis or upon request. These articles are often published in the "Entrada al Sol" section of the "Energy Source" newletter but may be distributed to selected media. A recent article featuring the NMSEI and NMERDI bioenergy project in Roswell was distributed by the Associated Press in a ten-state region.

RESULTS

The New Mexico Media task provided 13,526 informational or educational material units to 170 New Mexico media entities during Fiscal Year 73. Distribution of these materials by category and geographic area is shown in Table 3, while New Mexico media outlets are delineated by type and geographic area in Table 4.

Twenty radio stations requested and received "Thinking Solar" tapes each month. These stations are located throughout New Mexico and include KRTN (Raton), KAMQ (Carlsbad), KRWG (Las Cruces), KYVA (Gallup), and KTRC (Santa Fe). The broadcast service areas for the stations airing the NMSEI tapes cover all of New Mexico.

TABLE 3
NEW MEXICO MEDIA BY COUNTY
NMSEI INFORMATION AND EDUCATION PROJECT, FISCAL YEAR 73

County	Total Media Outlets	Print	Broadcast	
			Radio	T.V.
Bernalillo	47	16	25	6
Chavez	7	1	4	2
Cibola	3	1	2	
Colfax	3	2	1	
Curry	5	2	3	
De Baca	1	1		
Dona Ana	14	7	5	2
Eddy	7	2	5	
Grant	4	2	2	
Guadalupe	3	2	1	
Hidalgo	1	1		
Lea	9	5	4	
Lincoln	4	2	2	
Los Alamos	4	3	1	
Luna	2	1	1	
McKinley	3	1	2	
Otero	4	1	3	
Quay	2	1	1	
Rio Arriba	4	2	2	
Roosevelt	4	1	2	1
Sandoval	3	3		
San Juan	7	2	4	1
San Miguel	3	1	2	
Santa Fe	11	7	3	1
Sierra	4	2	2	
Socorro	2	1	1	
Taos	3	1	2	
Torrance	1	1		
Union	2	1	1	
Valencia	2	1	1	
Totals	170	75	82	13

TABLE 4
INFORMATION DISTRIBUTION TO NEW MEXICO MEDIA BY COUNTY AND CATEGORY, NMSEI INFORMATION EDUCATION PROJECT, FISCAL YEAR 73

	News Releases	Thinking Solar Columns	Features	Fillers	Radio & TV PSAs	Calendar of Events	Broadcast Actualities	Contacts	Thinking Solar Tapes	Cable TV PSAs	Video PSAs	Total
Bernalillo	2,626	104	752	256	814	92	15	126		10	24	4,819
Chavez	152		112	16	142	11	21	8		12	6	480
Cibola	83		48	16	56	22				12		237
Colfax	61		48	32	23	6			12	6		188
Curry	117	52	80	35	83	24	1	3	12	11		418
De Baca	21		16	16		3						56
Dona Ana	344	104	224	112	185	72	38	84	36	12	4	1,215
Eddy	173		112	32	130	20	7	9	27	14		524
Grant	66		64	32	44	12	6	8	12	6		250
Guadalupe	51		48	32	22	9				5		167
Hidalgo	17		16	16		4				5		58
Lea	195		144	80	100	45	6	7		30		607
Lincoln	60		64	32	42	10	2	2		10		222
Los Alamos	65	52	64	48	22	18		4		7		280
Luna	53	25	32	16	23	8	3	3	12	11		186
McKinley	69		48	16	44	6	3	8	11	8		213
Otero	109		64	16	72	8	2	3		18		292
Quary	40		32	16	21	5	1	1		5		413
Rio Arriba	79		64	32	43	11				4		233
Roosevelt	83		64	16	64	6	4	4	3	7		251
Sandoval	54		48	48		15						165
San Juan	139		112	32	110	12	4	6		14	6	435
San Miguel	56		48	12	44	6	1	2	12	6		187
Santa Fe	320		176	112	114	95	4	63	12	11	3	910
Sierra	101		64	32	46	14	1	4	5	9		276
Socorro	47		32	16	23	7	1	5	12	8		151
Taos	64		48	16	44	6	1	4	12	7		202
Torrance	14		16	16		6						52
Union	33	52	32	16	21	5			12	5		176
Valencia	47	52	32	16	23	6		6	12	5		199
Totals	5,339	441	2,704	1,143	2,238	564	121	360	202	371	43	13,526

NMSEI staff members were guests on 117 television or radio stations during Fiscal Year 73. Appearances on the "Illustrated Daily" (KNME--Albuquerque) and "New Mexico Today" (KBIM--Roswell) television talk shows generated many requests for additional information. Interviews on radio shows ranged from one-hour guest actualities on talk shows such as KSIL's "Breakfast at McDonald's" (Silver city), KTNM's "Lunch with John and Bunny" (Tucumcari) and K106's "Sunrise New Mexico" (Santa Fe) to 23 actualities with KOB Radio regarding various events and occurrences.

KOB-TV of Albuquerque donated video production facilities for four public service announcements and distributed them to 23 New Mexico, Arizona, Texas, and Colorado television stations at no charge. New Mexico's broadcast media received 1,095 public service announcements from NMSEI.

Nearly 5,700 news releases were mailed from NMSEI with 5,339 mailed to New Mexico media and 250 mailed to out-of-state sources. Thirteen New Mexico print mediums requested 441 "Thinking Solar" columns. When combined with the 2,704 feature articles and the 1,143 public service announcements or fillers which were mailed, it becomes apparent that education through media dispersal is a time consumptive yet valuable priority for NMSEI.

RECOMMENDATIONS

The New Mexico Media task is very successful. Accurate information is distributed through innovative delivery vehicles to media groups who recognize and use these high quality services. Much of this task's success can be attributed to the diligence of NMSEI's media coordinator. Through hard work and dedication, this media veteran has developed an outstanding network of mutually beneficial interrelationships.

It is reasonable to expect that the NMSEI media program will remain innovative, aggressive, and diligent. However, changes in the broadcast and print industries will require NMSEI's media staff to adopt new delivery techniques if successes equivalent to those of FY73 are to be obtained.

Print media outlets with computerized typesetting systems have begun to accept electronic information transfer from educational institutions. It is foreseeable that information will not be printed unless NMSEI can electronically transfer it into a newspaper's computer system where it may be edited without requiring data entry by the newspaper staff. This capacity is an NMSEI goal for Fiscal Year 74.

Evaluation of continuing services is critical to maintenance of a positive media program. A survey of "Thinking Solar" radio tapes and column users should be conducted during Fiscal Year 74 to validate their continuance.

TASK 4: INFORMATION SERVICES AND STATE FAIR EXHIBITION

OBJECTIVES

This task's objective is to transfer accurate, timely information regarding solar energy and energy conservation to New Mexicans. This is accomplished through two efforts.

First, NMSEI operates an information services center located at NMSEI. Information is provided to New Mexicans by telephone, written correspondence, and personal contact during visits to NMSEI. Longer-term NMSEI informational and solar technology adoption goals are also met by this task's efforts.

The New Mexico State Fair provides NMSEI an opportunity to inform and educate more people than any other single event in the state. Therefore, the second means by which NMSEI addresses its information transfer goals is an exhibit at the New Mexico State Fair. At the fair, NMSEI disseminates information through publications and individualized technical assistance to fair visitors.

The contracted responsibilities of this task are within the following subtasks.

Task 4.1 This subtask includes:

a. Provide accurate and timely information about solar and renewable energies to New Mexicans while maintaining and expanding services to meet demands.

b. Operate the SUN DIAL LINE, a toll-free energy information service under a contract from the state of New Mexico Energy and Minerals Department.

c. Train two part-time information assistants for the SUN DIAL LINE.

d. Provide professional assistance from the NMSEI technical staff to the SUN DIAL LINE staff for technically difficult questions.

Task 4.2 This subtask includes:

a. Compile and distribute a free solar energy and energy conservation informational packet to New Mexicans.

b. Research for and maintain basic technical information tiles. Provide this information to New Mexicans upon request.

c. Cooperate in an energy related information referral network with state and federal agencies.

d. Provide information about NMERDI and NMSEI activities, publications, and events that further NMERDI's research and development goals.

Task 4.3 Provide speaker's bureau services if expenses are underwritten by requesting agency or organization.

Task 4.4 Coordinate the NMSEI contribution to a cooperative New Mexico State Fair exhibit with NMERDI and NMEMD through Richard Cole.

APPROACH

NMSEI's Information Services task provides publications, specialized articles, and bibliographies in response to citizen requests for solar energy and renewable energy information. The NMSEI Information Services office is located at NMSEI but has established information distribution centers in Roswell, Silver City, Gallup, and Jemez Pueblo.

Telephone information requests may be received via the SUN DIAL LINE. Some local information requests are also received through NMSEI's conventional telephone service. Information requests are also received by mail and by personal contacts at workshops, seminars, meetings, and visits to NMSEI.

The Information Services staff is trained to assess a potential client's informational needs and respond in an appropriate fashion. They provide publications or research technical file materials for

answers to specialized requests. They also refer clients to other information sources or agencies if additional information is needed.

Solar energy or renewable energy bibliographies are provided on request. These bibliographies include books, periodicals, and conference proceedings. This service is especially helpful to researchers and educators.

NMSEI also provides information services at exhibitions and fairs. NMSEI has exhibited at the New Mexico State Fair since 1977. Information booths are also staffed at local energy fairs, trade exhibits, and educational conferences. NMSEI exhibitions are often cosponsored by other organizations participating in the fair.

RESULTS

The NMSEI Information Services task provided information to 5,639 New Mexicans during Fiscal Year 73. The staff responded to 4,409 SUN DIAL LINE information requests while 502 persons requested information by ordinary telephone methods. Mail requests accounted for 381 responses. Visitors to the information services area requested information in 347 instances.

Information requests demonstrated a distinct seasonal sensitivity. Information requests peaked during the colder winter months when 716 requests were received in October and 694 requests received during January. The fewest requests were received in June when only 294 persons needed information. The average volume of requests for the colder months (October - March) was 580. The warmer months (April - August) averaged 366 requests. Table 5 shows information services requests by category and month.

TABLE 5
INFORMATION SERVICES REQUESTS
NMSEI INFORMATION AND EDUCATION PROJECT
FISCAL YEAR 73

	July	August	September	October	November	December	January	February	March	April	May	June	Total
SUN DIAL	339	236	482	542	367	276	581	441	395	341	239	170	4,409
TELEPHONE	37	33	21	36	36	33	53	15	81	47	55	55	502
MAIL	51	28	35	48	31	13	37	12	33	13	40	40	381
VISITORS	19	17	27	90	21	19	23	49	28	29	11	14	347
TOTAL	446	314	565	716	455	341	694	517	537	430	345	297	5,639

Bibliographical requests have been growing with 21 received during the fourth quarter of Fiscal Year 73. Copies of the bibliographies provided by the information services task staff are in Appendix I.

The state fair exhibit was well attended. As noted in the report to NMERDI from Richard Cole, 21,853 persons attended the exhibit and 1,320 asked a question or showed advanced interest in the exhibit. NMSEI provided 162 man-hours to staff the exhibit and assisted the NMERDI-IC during the compilation of the fair visitors survey.

NMSEI exhibited at 18 additional trade fairs, exhibitions or community energy fairs during Fiscal Year 73. These exhibitions included the National Science Teachers Association convention (Albuquerque), the New Mexico Vocational Association conference (Albuquerque), the Earth Systems Development Institute Exposition (Albuquerque), and the SOLERAS conference (Las Cruces). The Albuquerque SolarFest was a very successful exhibition and was organized by NMSEI. Twenty-two commercial displays were erected and over 8,000 publications distributed to the 1,320 attendees.

Twelve of the additional exhibitions in which NMSEI participated were located in the Bernalillo County. The remainder were equally divided among the other regions of the state.

Table 6 lists all trade fairs, exhibitions, and conferences at which NMSEI exhibited.

Sixty-one man-days were used to staff the NMSEI information stands and displays at these additional trade fairs and exhibitions.

RECOMMENDATIONS

The information services task has been of invaluable assistance to many New Mexicans. It has provided consumers with unbiased publications

TABLE 6
NMSEI EXHIBITS
INFORMATION AND EDUCATION PROJECT
FISCAL YEAR 73

Date	Exhibit	Location	Cosponsor	Assigned Staff
8/7/84	Solar Home Economics	Albuquerque	Vocational Home Economics Teachers Assn.	Miller, Price
8/8-10	Vo-Tech Education Conference	Albuquerque	N.M. Vocational Assn.	Price
8/25-26	CEAP Energy Fair	Taos	NMEMD, City of Taos	Mumma
9/7-23	N.M. State Fair - "Energy: Research to Reality:	Albuquerque	NMERDIIC, NMEMD, NMSEIA	Mumma
9/15	N.M. Home Builders Conference	Albuquerque	NAHB	Price
9/28	CEAP Energy Fair	Silver City	NMEMD, City of Silver City	Price
10/6-7	Solar Energy Saving Exposition	Albuquerque		Hensley, Price
10/20	Southwest SolarFest	Las Cruces	SWRES/DOE, EPE, NMEMD, PNM, NMSU	NMSEI Staff
11/2-3	CEAP Energy Fair	Roswell	NMEMD, City of Roswell	Hensley
11/29-12/1	NSTA Convention	Albuquerque	NSTA	Rowland, Hensley
12/7-8	CEAP Energy Fair	Albuquerque	NMEMD, 5 Sandoval Pueblos	Hensley
2/16/85	Albuquerque SolarFest	Albuquerque	T-VI, PNM, ESDI, NMERDIIC, NMEMD, City of Albuquerque, NMSEIA	Hensley, Price Johnson, Sullins
3/7	Passive Solar Retrofits	Alamogordo	CES	Price
3/11-14	SOLERAS Conference	Las Cruces	Saudi Arabian Nat'l Center for Science and Technology, U.S. DOE, MRI	NMSEI Staff
3/29-31	Earth Systems Expo	Albuquerque	ESDI	Price, Hensley
4/12-13	Passive Solar Open House	Las Vegas	PNM, FHA, Roybal Const., Luna, T-VI	Hensley
4/19-21	Albuquerque Home and Garden Show	Albuquerque		Price, Hensley
4/24	National Consumer Week	Albuquerque	N.M. Att'y. General's Office	Hensley
4/26-28	Albuquerque Home Show	Albuquerque		Hensley, Price

NMSEI-NMSU exhibits are cosponsored by the New Mexico Energy Research and Development Institute.

and has assisted them in making an informed purchase. The information services staff is well trained and provides concise, clear answers to difficult questions.

Many efforts have been made to minimize the budgetary impact of this task. Continued attention must be given to this detail. Satellite information centers should be established in all major New Mexico cities. These should be located in public buildings and be passively staffed. Renewal of the information stands should be arranged with local officials or volunteers.

As with all ongoing tasks, continuing evaluations are necessary. A survey should be taken during FY 74 to analyze this task and refine its delivery.

NMSEI's exhibition efforts have been generally well received but no appropriate surveys of exhibition attendees have been conducted to validate this observation. Surveys should be conducted during all FY 74 exhibitions.

To provide low-cost public visibility and technology transfer, passive exhibits which do not require staffing should be developed during the first quarter of FY 74 and displayed in appropriate public facilities. These exhibits should incorporate currently developed informational materials.

TASK 5. SOLAR ENERGY WORKSHOPS

The principal objective of the solar energy workshops task is to transfer accurate, timely solar energy and renewable energy information to New Mexico citizens. Such information will facilitate energy decision making and is presented so as to be useful to consumers,

building managers, businessmen, and government officials. Longer term NMSEI informational and solar technology adoption goals may be met through these activities.

An additional objective of this task is to increase participation and cooperation with other solar groups within New Mexico. These would include NMERDI, NMEMD, Los Alamos National Laboratories, Sandia Laboratories, The Public Service Company of New Mexico, El Paso Electric, the rural Electric Cooperatives Association, the Earth Systems Development Institute, and the New Mexico Solar Energy Industries Association.

An additional secondary objective of the solar energy workshops program is to develop a flexible program schedule that will facilitate technology transfer in rural New Mexico but will appropriately mirror current New Mexico population density patterns.

The solar energy workshops program objectives are addressed through four subtasks:

Task 5.1 Develop a flexible schedule of workshops for each quarter of Fiscal Year 73 to include workshop subjects, dates, locations, registration fees, estimated budgets and evaluation methods.

Task 5.2 Design and develop each workshop program to include agenda, workshop handouts and audiovisual materials. Instructors will be trained if necessary.

Task 5.3 Coordinate, publicize and deliver each workshop. This will include coordination with appropriate cosponsors. NMERDI's

contribution to the workshops series will be recognized and given appropriate publicity.

Task 5.4 Evalute each workshop. Workshops will be redesigned if necessary and instructors retrained if appropriate. Evaluation of each workshop will be done by those responsible for development and instruction. Workshop attendees will also evaluate the workshop. Tabular summary of workshop attendance will be kept.

METHOD

Since 1977, NMSEI has used workshops to disseminate information on a wide variety of solar energy and energy related topics to selected audiences throughout New Mexico. The workshops have ranged from three-hour evening presentations covering introductory material for lay audiences to two-day passive solar design workshops focused on design and construction industry professionals. These workshops have developed an energy and economic awareness that has stimulated commercialization of conservation and solar technologies in homes, businesses, institutions, and industry. Growth of the New Mexico solar industry and its related investment sector has been fostered.

There are many advantages to using the workshop instructional format to effect technology transfer. It allows information to be carefully packaged and dispensed in a more personal manner. Specific decision making groups or geographic regions may be impacted. Audience feedback is immediately available and provides constructive criticisms that facilitate appropriate redirection of future workshops.

While these positive features provide strong support for a vigorous workshop program, planning pitfalls exist that can negate any advantages inherent to the workshop format. These would include failure to identify appropriate topics, inaccurate local needs assessment, inappropriate local cosponsors, and an inadequate publicity campaign.

To this end, the NMSEI solar energy workshops method begins with a strong planning process which directs limited resources to areas of the greatest needs. The information and education staff begins the planning process by identifying topics, target audiences and geographic regions which they believe require additional information efforts. The NMSEI staff summaries are validated by a telephone survey of community resources such as solar energy and construction industry representatives, businesspeople, government officials, energy educators, solar energy advocates, and community based action agency leaders. From this survey, an annual plan is developed that lists appropriate workshops for given areas within New Mexico. This plan may or may not include suggested delivery dates for the local workshops.

The NMSEI workshop coordinator uses the developed plan to identify cosponsors, arrange facilities, set agendas, schedule speakers, and organize publicity efforts. The workshop plan must be fiscally prudent so the coordinator uses a workshop planning coordination guide to track the budgetary impact of the event.

At NMSEI, all activities surrounding a workshop effort are coordinated by the workshop coordinator. Responsibilities for affiliated tasks are delegated by the coordinator to appropriate resources. Conflicts are facilitated by the project manager.

All workshop efforts are evaulated. Workshop instructors complete a workshop report form while attendees are asked to complete an evaluation. Evaluations are compiled by the workshop coordinator and a final report provided to the project manager. Any redirection or retraining is executed only after issuance of the final workshop report.

RESULTS

The NMSEI Information and Education staff presented 55 workshops in Fiscal Year 73. Workshops were defined as "an instructional session of more than one hour presented to a voluntarily participating audience." NMSEI also conducted 62 seminars during this period. Seminars are defined as "an instructional session of less than one hour presented to a voluntarily participating audience." Excluded from these totals are presentations to involuntarily participating audiences such as in schools or colleges. These figures will be reported in Task 6.

Workshops included a two-day energy auditor training for the Five Sandoval Pueblos, a passive solar design session for construction industry professionals in Roswell, a photovoltaic technology overview in Albuquerque, and hands-on solar crop drying workshops at Jemez and Zia Pueblos. NMSEI conducted 8 "Window Energy Strategies" workshops in conjunction with the Rural Electric Cooperatives in Clayton, Springer, Taos, Chama, Hernandez, Elephant Butte, Portales, and Springerville (AZ). NMSEI's "Self Reliant Home" workshop was presented in Farmington, Roswell, Gallup, Taos, Jemez Pueblo, and Albuquerque.

A four workshop series designed to assist solar businesses was cosponsored by NMSEI and the New Mexico Solar Energy Industries Association. These workshops were held in Albuquerque and utilized

national experts in business planning, computer use, marketing, sales, and financing.

NMSEI demonstrated the instrinsic flexibility of its workshops program by scheduling a consumer oriented "Solar Hot Water Systems" workshop series in response to the announcement of the expiration of the New Mexico renewable energy tax credits. These workshops addressed solar consumer purchasing issues and were presented Roswell, Portales, Gallup, Taos, Albuquerque, Las Cruces, Deming, and Las Vegas. This series will continue during Fiscal Year 74.

The "Low Cost Solar Adobe Construction" workshop in Las Cruces attracted 109 participants, while the "Self Reliant Home" workshop in Farmington registered 203 persons during three sessions. A total of 1,412 persons attended NMSEI workshops during Fiscal Year 73. Table 7 is a complete list of workshops and includes date, topic, location, cosponsors, and speakers.

"SolarFests" were held in Albuquerque and Las Cruces during Fiscal Year 73 and were the most successful single events in the history of NMSEI. The Albuquerque event was held at the Albuquerque Technical Vocational Institute and featured 43 one-hour seminars on solar energy, renewable energy and construction topics. Speakers included Bill Yanda, Paul G. McHenry, Jim Bishop, Dr. Vernon Risser, and Sara Balcomb. The Public Service Company of New Mexico described its passive solar home design assistance service while the Earth Systems Development Institute demonstrated the manufacture of adobe blocks. Twenty-two commercial exhibitors displayed their products during the SolarFest and 12 agencies provided information. NMSEI distributed 8,000 pieces of literature and estimates that more than 15,000 total pieces were distributed by the

TABLE 7
NMSEI-NMSU WORKSHOPS
FISCAL YEAR 73

Date	Workshop Title	Location	Cosponsor(s)	Speaker(s)	Attendance
7-30/31	Energy Auditor Training	5 Sandoval Pueblos	NMEMD, PNM	Miller	12
8-7	Solar Home Economics	Albuquerque	NM Vocational Assn.	Miller	25
8-18/1	Photovoltaic Applications	Albuquerque	NM Solar Electric	Schaefer	7
8-21/22	Photovoltaics: Fundamentals and Applications	Atlanta	Solar Age Magazine	Schaefer	60
8/21	Window Energy Strategies	Clayton	REC	Mumma	3
8/22	Window Energy Strategies	Springer	REC	Mumma	4
9-19/20	Photovoltaics: Fundamentals and Applications	Los Angeles	Solar Age Magazine	Schaefer	17
9-20	Passive Solar Energy	Gallup	UNM, PNM	Farrer, Pyde	7
10-1	Solar Home Economics	Alamogordo	CES	Hensley	69
10-1/2	Photovoltaics: Fundamentals and Applications	Denver	Solar Age Magazine	Schaefer	23
10-2	Window Energy Strategies	Taos	REC	Mumma	20
10-3	Window Energy Strategies	Chama	REC	Mumma	9
10-4	Window Energy Strategies	Hernandez	REC	Mumma	6

TABLE 7 (continued)

Date	Workshop Title	Location	Cosponsor(s)	Speaker(s)	Attendance
10-11	Geothermal Potential in Grant County	Silver City	NMEMD, SWDC	Whittier	20
10-16/17	Photovoltaics: Fundamentals and Applications	San Francisco	Solar Age Magazine	Schaefer	12
10-16/17	The Self Reliant Home	Farmington	San Juan College	Rowland	75
10-22	Geothermal Potential in Dona Ana County	Las Cruces	NMEMD	Whittier	2
10-23	Window Energy Strategies	Elephant Butte	REC	Mumma	8
10-24	Window Energy Strategies	Springerville	REC	Mumma	9
10-26	Passive Solar Energy	Los Alamos	City of Los Alamos	Bell	92
11-7	Window Energy Strategies	Portales	REC	Mumma	21
11-7	The Self Reliant Home	Roswell	City of Roswell, NMEMD	Rowland	14
11-7	Passive Solar Homes	Roswell	City of Roswell BCACC	Selinfreund	7
11-13	The Self Reliant Home	Socorro	REC, NMEMD	Rowland	20
11-14	The Self Reliant Home	Gallup	NMEMD, MACOG	Rowland	30
11-27	The Self Reliant Home	Taos	City of Taos, NMEMD	Rowland	
11-27	The Self Reliant Home	Jemez Pueblo	5 Sandoval Pueblos, NMEMD	Rowland	27

TABLE 7 (continued)

Date	Workshop Title	Location	Cosponsor(s)	Speaker(s)	Attendance
11-30	Renewable Resources Curriculum	Albuquerque	NSTA	Rowland	25
12-1	Passive Solar Homes	Albuquerque	NSTA	Rowland	40
12-7/8	Advanced Passive Solar Design	Roswell	City of Roswell, CES	Bell, Wilkes Feldman	30
1-17	Weatherization Techniques	Wagon Mound	NMEMD, Village of Wagon Mound	Hensley	12
1-30	Solar Business Financing	Albuquerque	NMSEIA, PNM	Yudelson, Spitzer	38
2-1	Solar Science/Appropriate Technology-Math Science Conference	Las Cruces NMEMD	NMSU, NMSTA	Rowland	45
2-5	Energy Saving Window Treatments	Silver City	WNMU	Rowland	11
2-6	Passive Solar Design	Silver City	NMEMD, City of Silver City	Selinfreund	29
2-13	Computers in the Solar Business	Albuquerque	NMSEIA, PNM	Wilcox, Ashton	32
2-23	Low Cost Solar Adobe Construction	Las Cruces	NMSU, ESDI	Tibetts, Caldwell, Proctor, Selinfreund	109
3-1	Teaching Solar Energy	Gallup	Gallup-Mckinley Public Schools	Rowland	51

TABLE 7 (continued)

Date	Workshop Title	Location	Cosponsor(s)	Speaker(s)	Attendance
3-6	Marketing Solar Products	Albuquerque	NMSEIA, PNM	Shama, Benjamin	32
3-7	Passive Solar Retrofits	Alamogordo	SEA, CES	Hensley	36
3-20	Planning the Solar Business	Albuquerque	NMSEIA, PNM	Radosevich Apodaca	20
3-29	Basics of Photovoltaics	Albuquerque	NMAMA	Hensley	21
4-10	Solar Hot Water Systems	Portales	NMEMD, KENW TV, ENMU	Hensley	41
4-20	Passive Solar Home	Las Cruces	NMSU	Farrer Selinfreund	26
4-25	Solar Hot Water Systems	Gallup	NMEMD, MACOG	Hensley	7
5-2	Solar Hot Water Systems	Taos	NMEMD, CES	Hensley	10
5-3	Solar Hot Water Systems	Albuquerque	T-VI	Hensley	16
5-4	Passive Solar Remodeling	Albuquerque	T-VI	Hensley Selinfeund Miller, Yanda	12
5-7	Solar Hot Water Systems	Roswell	NMEMD, City of Roswell	Hensley	23
5-22	Solar Hot Water Systems	Las Cruces	NMSU	Hensley	58
5-23	Solar Hot Water Systems	Deming	NMEMD, CES	Hensley	35
5-28	Solar Crop Drying	Jemez Pueblo	NMEMD, 5 Sandoval Pueblos	Hensley	12

TABLE 7 (continued)

Date	Workshop Title	Location	Cosponsor(s)	Speaker(s)	Attendance
5-28	Solar Crop Drying	Zia Pueblo	NMEMD, 5 Sandoval Pueblos	Hensley	5
5-29	Passive Solar Remodeling	Santa Fe	NMEMD, CES	Hensley	25
5-30	Passive Solar Remodeling and Solar Water Heating	Las Vegas	NMEMD, PNM	Hensley	6
6-25	Passive Solar Design	Santa Fe	PNM	Farrer	6

All workshops presented by the New Mexico Solar Energy Institute are sponsored by the New Mexico Energy Research and Development Institute.

participants. This one day event was attended by 1,320 persons with total attendance at the seminars well in excess of this figure. The largest attendance at a single seminar was 121 persons at PNM passive solar design session.

The Las Cruces event was held at the Southwest Region Experiment Station and was attended by 565 people. Fifteen seminars were held during this event. A speakers forum was held during the Las Cruces SolarFest and featured U.S. Representative Joe Skeen, NMEMD Secretary Paul Biderman, and NMERDI Director Dr. Larry Icerman, and Dr. Paul Gilman, legislative assistant to Senator Pete V. Domenici.

Nearly 20 percent (11) of NMSEI's workshops were held in the Albuquerque area, while 61.5 percent (32) of the workshops were in northern New Mexico. Dona Ana County hosted 9.6 percent (5) of NMSEI's workshops, and 7.1 percent (4) were conducted out-of-state. Table 8 shows a geographic dispersal of NMSEI workshops by New Mexico county and month, while Appendix L lists workshops by county and topic.

Over 72 percent (44) of NMSEI's seminars were in Bernalillo County. Appendix M lists all NMSEI seminars held in Fiscal Year 73.

NMSEI also hosted the SOLERAS conference during Fiscal Year 73. This conference is a joint venture of the Saudi Arabia National Center for Science and Technology and the United States Department of Energy. Over 100 persons from 13 countries attended this five day conference. This was the first such workshop presented at an American university.

RECOMMENDATIONS

While the solar energy workshops program is the pillar of NMSEI's public information and education program, it is also an industrious and

TABLE 8
NMSEI WORKSHOPS FY'73

County	July	August	September	October	November	December	January	February	March	April	May	June	Total
Bernalillo		2			1	1	1	1	3		2		11
Chaves					2	1					1		4
Colfax		1											1
Dona Ana				1				2		1	1		5
Grant				1				2					3
Harding							1						1
Luna											1		1
McKinley			1		1				1	1			4
Otero				1					1				2
Rio Arriba				2									2
Roosevelt					1					1			2
Sandoval	1			1	1						2		5
San Juan				1									1
San Miguel											1		1
Santa Fe											1	1	2
Sierra					1								1
Socorro						1							1
Taos					1	1					1		3
Union		1											1
Total	1	4	1	9	8	2	2	5	5	3	10	1	51
Out-of-State		1	1	2									4
	1	5	2	11	8	2	2	5	5	3	10	1	55

expensive activity. Every effort must be made to refine the workshop planning process. It is imperative that this workshop program continue to accurately assess the needs of its service region while maintaining a high quality of instruction. Market oriented workshops to provide information and stimulate appropriate purchase behavior should be a priority. The FY 73 trend toward program coordination with local cosponsors should be continued. It adds credibility and provides a base for the beginning of local networks. In the long term, it will also decrease the financial burden on NMSEI as these groups become solar energy information resources for their communities.

NMSEI workshop schedule should continue to reflect the population density and growth patterns of New Mexico. Attention should be given to burgeoning communities such as Rio Rancho and Roswell.

SolarFests should be held in Albuquerque and Las Cruces each year.

This ambitious program was developed through tenacious dedication to quality and excellence, and it is these qualities that will be required to maintain its current lofty stature.

TASK 6. SOLAR ENERGY EDUCATION

OBJECTIVES

The solar energy education task has short- and long-range objectives and uses New Mexico's existing formal educational structure to maximize the scope and effectiveness of its technology transfer.

Primary short-term objectives for this task include facilitating adoption of solar energy and renewable energy curriculum materials in public schools, publishing solar energy related classroom activity units, and supervising adult education solar energy course offerings.

The long-term objective of this task is to increase the solar energy and renewable energy literacy of New Mexico citizens and facilitate adoption of solar energy technologies.

The contractual responsibilities of this task are met through four subtasks:

Task 6.1 Publish the "Solar Energy Educator" newsletter on a quarterly basis. This newsletter will contain solar energy information, classroom activities and bibliographical resources and will be sent to elementary and secondary teachers throughout the state.

Task 6.2 Compile and distribute existing education materials. Assist teachers in infusing these materials into existing curriculums and programs. This subtask will include compilation of a library of existing materials and distribution of these materials to teachers.

Task 6.3 Maintain existing adult education courses at NMSU (Las Cruces), UNM (Gallup) and San Juan College (Farmington). Expand the adult education course to UNM (Community College - Albuquerque).

Task 6.4 Seek additional funding to expand solar education materials and train teachers in their use.

METHOD

NMSEI transfers solar energy and renewable energy information to school administrators and educators through the "Solar Energy Educator." This is a quarterly newsletter and contains solar energy information, classroom activities, bibliographical resources and curriculum materials resources. This newsletter is also distributed to the education departments New Mexico's colleges.

NMSEI maintains a solar energy curriculum library in the NMSEI information services center. Teachers learn of this resource in three ways. First, each issue of the "Solar Energy Educator," publishes a list of new materials. Second, bibliographies are made available to teachers at state and national education conferences. Third, education task staff members display resources during personal visits to schools. Materials are loaned to interested teachers upon request.

In 1982, NMSEI developed an adult education course entitled "The Self Sufficient Solar Home." This course includes segments on passive solar construction, photovoltaics, biointensive gardening, and wind energy. It is taught at universities and colleges within the state.

Additional funds for NMSEI education activities are sought from many sources including the National Science Foundation, the New Mexico Department of Education, and the Department of Energy. Educational interactions with industry sources are also being developed.

RESULTS

Four issues of Volume 1 of the "Solar Energy Educator" were published during Fiscal Year 73. These issues were sent to each school principal (2 copies), secondary science department head, and teachers

who filed requests for inclusion of the NMSEI educator mailing list. In addition, nearly 600 copies were sent to teacher training institutions for distribution to student teachers.

A survey to determine the usefulness of this survey was conducted in April 1985 and was sent to all recipients of the newsletter. Results indicated each copy was read by an average of 7.7 people. Eighty-eight percent of the respondents indicated the information in the newsletter was used in their school. This represents 63 percent of all New Mexico School districts.

Each of the four parts of the newsletter are adequately used with the solar energy information used by 80 percent of the readers and the elementary activities used by 60 percent. There is little doubt this is a quality publication and is used extensively by New Mexico educators.

One hundred and fifty curriculum guides and resources are in the NMSEI curriculum library and range in grade level from preschool through adult.

NMSEI curriculum resources were available to teachers attending the New Mexico Vocational Association Home Economics conference, the National Science Teachers Association Western Conference, and the New Mexico Science and Mathematics Teachers Association conference. NMSEI presented workshops at each of these conferences and staffed an information booth. Teacher guides and informational packets were provided upon request at these conferences.

Additionally, curriculum infusion was enhanced by teacher inservice workshops in the Gadsden School District and the Gallup-McKinley County School District.

During Fiscal Year 73, over 1,000 teachers received teacher packets at conferences while another 345 received materials at NMSEI workshops.

Materials were mailed to 472 teachers as a result of requests via THE SUN DIAL LINE and 228 teachers received materials when an NMSEI staff member visited their school. Materials were given to 89 preteachers at Western New Mexico University and 234 preteachers at Eastern New Mexico University during NMSEI educator forums.

Presentations were made by NMSEI staff members to 5,534 students and 194 teachers during Fiscal Year 73 at 46 schools. Presentations were made in Albuquerque, Cliff, Columbus, Deming, Dora, Elida, Gallup, Las Cruces, Portales, Reserve, Roswell, Silver City, T or C, Tucumcari, Tularosa, Zuni Pueblo, and many other New Mexico cities. A complete list of educator workshop and school presentations is in table 9.

"The Self Sufficient Solar Home" adult education course was offered at San Juan College (Farmington), the University of New Mexico (Community College - Albuquerque), Western New Mexico University (Silver City), New Mexico School of Mines and Technology (Socorro) and the University of New Mexico (Gallup). Low enrollments caused cancellation of the course at the last two sites.

A survey of 86 students enrolled in the adult education course during 1984 was completed. Sixty-nine percent of the students had used the information they received in their home or business while twenty-two percent had spent money on projects as a result of the course. The total amount expended was $143,116 or an average of $6,505 per project. All respondents indicated they thought the course was worthwhile.

Additional funds for education activities were obtained from the U.S. Department of Energy Appropriate Technology program. Proposals were submitted to the National Science Foundation and the Tennessee Valley Authority.

TABLE 9
NMSEI-NMSU SUMMARY OF EDUCATION EVENTS - JULY 1, 1984 TO JUNE 30, 1985

DATE TIME	TITLE	LOCATION	SPEAKERS	NO.
1984				
11/15	Solar Physics	Gallup High School Gallup	Rowland	50
1985				
2/5 1 hr	Energy Saving Window Treatments Home Economics Education Class	WNMU Silver City	Rowland	10
2/5	Teaching Solar Social Studies Elementary Social Studies Methods Class	WNMU Silver City	Rowland	18
2/6	Teaching Solar Across the Curriculum - Teachers/Aids	WNMU Silver City	Rowland	67
2/6 6 hrs	Uses of Solar Energy	La Plata Jr. High Silver City	Slavin	210
2/7 6 hrs	Uses of Solar Energy	Stout Intermediate Silver City	Slavin	225
2/8 6 hrs	Uses of Solar Energy	Reserve Elementary Reserve High School	Slavin	127
2/11 5 hrs	Uses of Solar Energy	Gadsen Jr. High Anthony	Slavin	80
2/15 7 hrs	Uses of Solar Energy	Arroyo de Oso Elementary Albuquerque, N.M.	Slavin	185
2/22 7 hrs	Uses of Solar Energy	Anthony Elementary Anthony, N.M.	Slavin	185
2/26 7 hrs	Uses of Solar Energy	San Miguel Elementary, San Miguel	Slavin	190
2/28 7 hrs	Uses of Solar Energy Teachers/Students	Deming Junior High Deming	Slavin	350

DATE TIME	TITLE	LOCATION	SPEAKERS	NO.
1985				
3/1	Teaching Solar Energy In Service Teacher Training	Gallup High School Gallup	Rowland	12
3/1 2 hrs	Introduction to Solar Energy	Deming Sunshine Elementary	Slavin	51
3/4 4 hrs	Introduction to Solar Energy	Deming Bell Elementary	Slavin	81
3/4 3.5 hrs	Introduction to Solar Energy	Deming Chaparral	Slavin	81
3/5 5.5 hrs	Uses of Solar Energy Solar - Biomass Solar - PV	Hot Springs High School, T or C	Rowland	159
3/5 5.5 hrs	Solar Design	Hot Springs High School, T or C	Hensley	170
3/5 6.5 hrs	Introduction to Solar Energy	T or C Elementary T or C	Slavin	186
3/6 7 hrs	Introduction to Solar Energy	La Union Elementary La Union	Slavin	130
3/8 2 hrs	Introduction to Solar Energy	Martin Elementary School, Deming	Slavin	55
3/8 3.5 hrs	Introduction to Solar Energy	Smith Elementary School	Slavin	145
3/11 5 hrs	Introduction to Solar Energy	Memorial Elementary Deming	Slavin	92
3/13 6 hrs	Introduction to Solar Energy	Hatch Elementary School, Hatch	Slavin	88
3/15 7 hrs	Introduction to Solar Energy	Mesilla Elementary Mesilla	Slavin	195

DATE TIME	TITLE	LOCATION	SPEAKERS	NO.
1985				
3/22 7 hrs	Introduction to Photovoltaics Introduction to Solar Energy	T or C Middle School T or C	Slavin	138
3/25 3.5 hrs	Introduction to Solar Energy	University Hills Elementary	Slavin	66
3/26 6.5 hrs	Introduction to Solar Energy	Tularosa Elementary School, Tularosa, N.M.	Slavin	164
3/27	Introduction to Solar Energy	Fairacres Elementary Las Cruces	Slavin	20
4/1	Introduction to Solar Energy	Valley View Elementary, Las Cruces	Slavin	130
4/2	Introduction to Solar Energy	Hatch Elementary Hatch	Slavin	69
4/3	Introduction to Solar Energy	Dona Ana Elementary Las Cruces	Slavin	225
4/9 4.5 hrs	Introduction to Solar Energy	Dora Elementary Dora High School	Slavin	152
4-10 3 hrs	Teaching Solar	ENMU, Portales	Rowland	69
4/10	Solar Remodeling	TAVI, Tucumcari	Hensley	12
4/10 3.5 hrs	Introduction to Solar Energy	Brown Elementary Portales	Slaving	212
4/11 4 hrs	Introduction to Solar Energy	Lindsay Elementary Portales	Slavin	183
4-11 4.5 hrs	Teaching Solar	ENMU, Portales	Rowland	75
4/11	Passive Solar Remodeling, Solar Wall	ENMU, Portales	Hensley	53

DATE TIME	TITLE	LOCATION	SPEAKERS	NO.
1985 4/12 1.5 hrs	Introduction to Solar Energy	Elida High School Elida	Rowland	21
4/12 3.5 hrs	Introduction to Solar Energy	Elida Elementary	Slavin	68
4/12	PV, Solar Home Economics	ENMU, Portales	Hensley	61
4/16	Introduction to Solar Energy	Central Elementary Las Cruces	Slavin	79
4-17	Introduction to Solar Energy	Arrey Elementary T or C	Slavin	83
4/18	Introduction to Solar Energy	Fairacres Elementary Las Cruces	Slavin	128
4/19	Introduction to Solar Energy	Conlee Elementary	Slavin	139
4/23	Introduction to Solar Energy	Zuni Middle School	Slavin	124
4/24	Introduction to Solar Energy	Navajo Elementary Gallup	Slavin	173
4/25	Introduction to Solar Energy	Roosevelt Elementary Gallup	Slavin	116
4/26	Introduction to Solar Energy	Smith Lake Elementary Gallup	Slavin	43
4-29	Introduction to Solar Energy	Garfield Elementary Hatch	Slavin	89
4/30	Introduction to Solar Energy	La Mesa Elementary Las Cruces	Slavin	135
5/23	Uses of Solar Energy	EXCEL High School Las Cruces	Rowland	13
6/14	Uses of Solar Energy	Apodaca Day Camp Las Cruces	Rowland	99

NMSEI solicited and obtained 250 solar cells from Solarex, Inc., to distribute to schools in New Mexico. To date, 85 schools have requested and received two cells and a packet of materials which includes photovoltaics laboratory experiments.

RECOMMENDATIONS

As indicated in the survey summary, the "Solar Energy Educator" should be continued. Strong support for this publication has be given by many educators and administrators.

Adult education offerings should be pursued only at institutions which currently have strong adult education programs and where a competent instructor can be identified. It is encouraging that the "Self Sufficient Solar Home" has been offered for five consecutive semesters at San Juan College and has had adequate enrollment each time. Care must be taken to assess the local adult education "market" for this course before allocating resources to the development of additional sites.

An examination of existing solar energy curriculum materials has indicated three glaring weaknesses. First, virtually no materials are available for use at the primary level. Second, higher level materials are usually in the form of isolated classroom activities. Third, most materials are out-of-date. Many are also out-of-print.

Although some new materials will be developed to fill this void, new delivery mechanisms must be examined if students are to be exposed to this rapidly changing technology. Greater levels of participation in out-of-school programs should be explored.

Greater levels of interactions with the solar energy industry could lessen the budgetary impact of the solar energy education task. Interactions with companies involved in photovoltaic technologies should be emphasized.

Classroom presentations present both a challenge and a problem. In most cases, these presentations occur in a curricular vacuum where there is not relationship between the solar energy presentation and ongoing classroom activities. Educational research indicates such activities have little long-term pedagogical value. Future presentations should use a coordinated curriculum approach and use the NMSEI presentation to augment ongoing instruction.

These presentations do serve as a public relations tool and as such, may have sufficient value as to merit their continuance.